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ART. I.--Observations on the Botany of Illinois, more especially in reference to the Autumnal Flora of the Prairies. In a letter to Daniel Drake, M.D., &c.

My Dear Sir:

The interest which you have long taken in every thing relating to the Natural History of the Western States, and the desire which you have so frequently expressed to connect the study of Botany with the pursuit of medicine, will, I trust, be a sufficient apology for my addressing these observations to you. Having moreover, very recently yourself traveled over a part of the country to which they refer, you will be the better enabled to judge of their correctness.

In a tour which I took through the State of Illinois, a few years previous to your own, I had the pleasure of being ac-

This copy, except for omission of a long footnote, is page by page and line by line as in the original. Spelling is unchanged.

companied by my brother, and one or two other individuals, who took a considerable interest in the objects which mainly prompted my journey; and traveling in a light covered wagon, well prepared for making extensive collections, and vigilantly on the look-out for every object of interest, I may safely say that few such escaped our observation. Our visit to this interesting region was made in the latter part of summer, and extended so late into the fall, that severe frosts had put an end to vegetation before our return; so that my remarks must be considered as referring to the <u>autumnal</u> <u>Flora</u> of the Prairies, and may not be applicable to that of the spring, or early summer. We entered the State of Illinois from Terre Haute on the Wabash river, near the line dividing that State from Indiana; thence we traveled in nearly a north-western direction to Peoria, on the Illinois river; through Paris, Urbanna, Bloomington, and Mackinaw: and returning we took a more southern route through Tremont, Springfield, Hillsborough, Maysville, and Lawrenceville to Vincennes; where we recrossed the Wabash, which here forms the boundary between the States of Indiana and Illinois. This trace extending over a distance of nearly 400 miles, led us through the central portion of the State in two different lines, at a considerable distance apart, and gave us an opportunity of seeing and examining the fact of the country and its productions under a great variety of aspects.

In a Geographical point of view, the surface of Illinois may be very appropriately, as it is naturally, divided into three districts. First--The heavily timbered tracts which for the most part occupy the southern portion of the State, bordering on the Ohio river, and which, extending into the middle and northern portions, are found in detached bodies surrounded by prairies, and in these situations are called 'Groves.' These groves are, for the most part, contiguous to, and often bounded by water-courses, which have preserved them from the action of fire. Secondly--The open prairies, of from one to twenty miles in diameter, entirely destitute of

trees, and indeed of all other woodly plants, except along the margin of water courses which occasionally pervade them. Thirdly--'The Barrens,' or tracts somewhat intermediate between the two former, being sparsely covered with oak trees of several different kinds, and of considerable size, with a dense undergrowth of various shrubs and annual plants. This third region bears a close relationship, both in appearance and productions, to those districts in Kentucky, which are called 'Barrens'--tracts of country which seem to be in a state of transition from more open prairies to densely timbered forests.

The vegetation of these three districts is, of course, essentially different; but apart from the presence or absence of trees, which constitute the grand feature of distinction, the annual and suffruticose plants are widely different, and indeed in many respects entirely dissimilar. It is, however, to the productions of the open prairies that I shall chiefly confine myself in this communication: and even they vary greatly as the surface of the prairie may be high, rolling, rich and dry, or low, flat, wet and clayey.

The first sight of a prairie with which we were greeted was in the neighborhood of Terre Haute, on the eastern side of the Wabash, and consequently in the State of Indiana. In approaching this new and apparently thriving town, from the east, over the national road, the eye is filled with the prospect of an extensive plain entirely destitute of all timber-trees, and stretching to a great distance both above and below the town. Such a view, agreeable at all times, was peculiarly so as it opened suddenly upon us just after emerging from the heavily wooded forest through which we had traveled all day. The Terre Haute prairie, however, has been all reclaimed, or rather, botanically speaking, desecrated by the hand of man, and no portion of it now remains in a state of nature. Corn, grass, small grain, and other cultivated crops now occupy the hundreds of acres, which lately bloomed and blossomed with indigenous productions; and almost the only relics of these to be seen, were occasion-

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ally on the road-side, or in fence-corners, a few plants of Verbena stricta and Vernonia corymbosa.

Twenty miles west of the Wabash at this point, we met with the first prairie in a state of nature; and from this, extending northward to the Lakes, and westward to the Mississippi, they continue, increasing in magnitude, and interrupted only by occasional groves of timber, so as to occupy by far the largest portion of the central, eastern, western, and northern portions of the State of Illinois.

On fairly entering the prairie region, and reaching the centre of one of these immense natural meadows, the view presented to the eye of a novice in such scenery, is one of the most pleasing sort. But beautiful, imposing, and even grand as is this spectacle, I must own, that in a botanical point of view, I was disappointed! The Flora of the prairies--the theme of so much admiration to those who view them with an ordinary eye,--does not, when closely examined by the Botanist, present that deep interest and attraction which he has been led to expect. Its leading feature is rather the unbounded profusion with which a few species occur in certain localities, than the mixed variety of many different species occurring any where. Thus from some elevated position in a large prairie the eye takes in at one glance thousands of acres, literally empurpled with the flowering spikes of several species of Liatris, among which the most predominant are L. spicata, L. squarrosa, L. scariosa, L. cylindracea, and L. pycnostachya. In other situations, where a depressed or flattened surface and clayey soil favor the continuance of moisture, a few species of yellow-flowered Coreopsis occur in such profuse abundance as to tinge the entire surface with a golden burnish. The species of this genus more commonly met with in such situations, were Coreopsis trichosperma, C. senifolia, C. tripteris, C. palmata, &c., &c. This peculiarity of an aggregation of individuals of one or more species, to something like an exclusive monopoly of certain localities, obtains even in regard to those plants which are the rarest and least frequently met with; for whenever one specimen was found

there generally occurred many more in the same immediate neighborhood. The Dalea alopecuroides, (Willd.), which I met with but once, was found in that locality in the greatest abundance. The Satureja hortensis, which I believe is not regarded as indigenous to North America, was seen once by us in the greatest profusion, and that, too, in a situation the least favorable to the idea of its having been introduced--the centre of a large prairie, where no settlement could have been made. At some places between Peoria and Springfield the road-sides and even the beaten path, were so completely covered over with the little Boebera chrysanthemoides, that, trodden under our horses' feet, it exhaled a strong and nauseating odor. In many such localities this noisome weed seems to take the place of the Anthemis cotula and A. arvensis (Mayweed and Dog-fennel,) in the more settled portions of the Western States. In the neighborhood of Springfield, again, and especially in the out-lots of that town, we found the ground covered, to the exclusion of almost every other vegetation, with a small species of Ambrosia (A. bidentata) which, at the season in which we saw it, being out of flower, and ripening its dark-colored seed, gave to the common an aspect as dreary as "the bleak and blasted heath where Macbeth met the witches." In illustration of this peculiarity of the Botany of the prairies, I will only further remark that we did not observe the little Erigeron divaricatum until we reached Bloomington, in the commons of which town it is extremely abundant; and that it ceases to occur, or is but rarely seen, a few miles south of that.

There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where, and are intermixed in greater or less degree and variety among all the other plants of the prairies,) which may be considered as indigenes of the prairie region generally.--Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation than any others, the Silphium gummiferum, Parthenium integrifolium, Kuhnia critonia, Ceanothus intermedius, (which here takes the

place of C. Americanus in the Barrens of Kentucky,) Prenanthes Illinoensis, Eryngium aquaticum, Petalostemum violaceum, Dracocephalum Virginianum, Baptisia leucantha, several species of Liatris, Coreopsis, Aster,[1] Solidago,[2] Rudbeckia,[3] Helianthus,[4] Pycnanthemum, Gerardia, Pedicularis, Gentiana, &c., &c. Those two beautiful plants, for our knowledge of both of which, I believe, we are indebted to Mr. Nuttall, the Aster sericeus, and Amorpha canescens, are very generally diffused, but not in the same abundance with many others. Indeed, they constitute an exception to the habit of congregation which obtains among so many of their associates.

As is the case, I believe, with the American Flora throughout the United States, and indeed, the whole Continent, the autumnal botany of the prairies exhibits a large preponderance of the Compositae. Besides those already mentioned, we may here enumerate, as of frequent occurrence, Chrysopsis mariana, Helenium autumnale, Boltonia glastifolia and B. asteroides, Bidens frondosa and B. chrysanthemoides, Eupatorium serotinum, E. aromaticum, E. ageratoides, E. purpureum, E. perfoliatum, &c., Cnicus glutinosus, C. Virginianus, C. muticus, C. altissimus, &c., Silphium laciniatum, S. integrifolium, S. terebinthinaceum, &c., Prenanthes aspera, P. virgata, P. racemosa, P. serpentaria, &c., Vernonia fasciculata, V. corymbosa, and one or two other species.

In a farmer's, or rather a grazier's estimation, the grasses would be regarded as the most valuable of the natural productions of the prairies; and we will next mention some of

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[1]Aster laevis, A. Novae Angliae, A. rigidus, A. gracilis, A. phlogifolius, A. concolor, A. azureus, A. undulatus, A. multiflorus, A. oblongifolius, A. turbinellus, A. carneus, &c.

[2]Solidago rigida, S. nemoralis, S. graminifolia, S. Ridellii, S. serotina, S. speciosa, S. Ohioensis, S. neglecta, &c.

[3]Rudbeckia purpurea, R. laciniata, R. hirta, R. subtomentosa, R. pinnata, &c.

[4]Helianthus angustifolius, H. rigidus, H. occidentalis, H. grosse-serratus, H. tomentosus, H. mollis, H. pubescens, H. microcephalus, H. tomentosus, H. laetiflorus, &c.

places of C. Americanus in the Barrens of Kentucky.) Echinacea Illinoensis, Eryngium aquaticum, Petalostemon violaceum, Pycnanthemum Virginianum, Baptisia leucantha, several species of Liatris, Coreopsis, Aster,[1] Solidago,[2] Rudbeckia,[3] Helianthus,[4] Prenanthemum, Gerardia, Pedicularis, Gentiana, &c., &c. Those two beautiful plants, for our knowledge of both of which, I believe, we are indebted to Mr. Nuttall, the Aster sericeus, and Amorpha canescens, are very generally diffused, but not in the same abundance with many others. Indeed, they constitute an exception to the habit of congregation which obtains among so many of their associates.

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[2]Solidago rigida, S. nemoralis, S. speciosa, S. Riddellii, S. serotina, S. scabra, S. Ohioensis, S. rigida, &c.

[3]Rudbeckia speciosa, R. laciniata, R. hirta, R. subtomentosa, R. pinnata, &c.

[4]Helianthus angustifolius, H. rigidus, H. occidentalis, H. grosse-serratus, H. tomentosus, H. mollis, H. pubescens, H. giganteus, H. strumosus, H. laetiflorus, &c.

those which are of most frequent occurrence, omitting all reference to the allied tribe of Cyperaceae, but few of which were observed, in consequence, perhaps, of the late season at which our visit was made. Among the most predominant of the Gramineae, on the rich, dry, and rolling prairies are several species of Andropogon, as A. furcatum, A. ciliatum, A. mutans, A. scoparium, &c., Aristida tuberculosa, A. stricta, A. gracilis, &c., Elymus Canadensis, (var. glaucifolius.) E. Virginicus, E. mollis, &c., Trichodium laxiflorum, and Vilfa heterolepsis. In flat and marshy situations these give place to various species of Panicum, as P. geniculatum, P. agrostoides, P. dichotomum, P. virgatum, P. latifolium, and the universally diffused P. crus-galli, Leersia Virginica, and L. oryzoides, Spartina polystachya and S. cynosuroides. All these grasses in their young and tender states are eagerly devoured by cattle: as they become harder and less succulent by age, the coarser are rejected and the more tender are sought for. Among these, I believe, the Vilfa, before mentioned, is a general favorite, both for grazing and for hay. All of them, however, are cut promiscuously for this purpose, and when they occur, as frequently they do, in large natural meadows, occupying the ground to the almost entire exclusion of other vegetables, they yield a productive return to the labor of the mower; and when well cured make excellent hay. Our horses, which had never before been accustomed to any other than the cultivated grasses, ate this natural hay with great avidity. The quality of these grasses, both for pasturage and mowing, is much improved by the burning of the prairies during the winter, which, destroying the dead and dry stems, affords a better and earlier bite in the spring, as well as a cleaner swath for the scythe: and by protecting certain portions of the prairie from the action of fire until the spring or early summer, vegetation is then so much retarded by a 'late burn,' as the settlers call it, as to afford good pasturage throughout the latter part of the season.

To this action of the fires, which probably for ages have annually passed over these plains, consuming in their progress

all relics of vegetable matter, both woody and herbaceous, is perhaps to be mainly ascribed the color of the soil, which for the most part is literally as black as coal, and in some situations of two or three feet in depth. And to this excess of carbonaceous matter, imparted to the soil of these prairies, is it perhaps to be ascribed that their productions, both in cultivated crops and natural growths, are by no means so rank or luxuriant as one might be led to expect. The Indian corn, though well-eared, was not so tall as I have frequently seen it in Kentucky and Ohio, on lands apparently much inferior in fertility; the different kinds of small grain, though heavily-headed, had a much shorter straw; and many of the natural productions, common to the Illinois prairies and the barrens of Kentucky, were less luxuriant in growth than I have observed them to be in the latter district, though the soil of the barrens has not the same appearance of fertility. This subject deserves particular investigation, and an accurate analysis of the prairie soil might lead to very useful practical deductions. One of our fellow-travelers, a farmer by profession, ascribed the appearance, above mentioned, to a 'sourness' in the soil. But the amount of carbonaceous and alkaline matters resulting from such frequent burnings would rather lead to an opposite conclusion.

Among the oeconomical and medicinal plants of the prairies may be mentioned Gentiana ochroleuca, the roots of which have somewhat the bitterness of the officinal species, (G. lutea, of Europe,) Prenanthes serpentaria, several species of Liatris, the tuberous roots of which are possessed of acrid pungent qualities, and Eryngium aquaticum; all these plants have a considerable reputation, which perhaps is but little deserved, against the bites of poisonous serpents, and hence they are known indifferently by the names of 'snake-root,' 'button snake-root,' rattle-snake's masterpiece,' &c. Frasera verticillata is not so frequently seen in the more open prairies as in the thinly-wooded barrens. Polygala Senega and Asclepias tuberosa are abundant in both these localities. The different species of Silphium mentioned, exude from their

stems a pearly resinous matter, very similar in appearance and sensible properties to turpentine, and used for the same purposes. The roots of the beautiful Petalostemum violaceum have a warm pungent quality, which suggested its employment, among the thousand other articles, in the treatment of cholera, and the plant is now known on the prairies as the 'cholera-weed.' Our two most valuable indigenous bitters Eupatorium perfoliatum and Sabbatia angularis are abundant, and Aristolochia serpentaria is seen occasionally in the groves, where various species of dogwood (Cornus) are also of frequent occurrence. Mr. J. A. Lapham, of Wisconsin, informs me that in that territory, the Amorpha canescens is called 'lead-plant,' from the circumstance of its growth being considered indicative of the presence of that mineral. If the same sign should hold good in Illinois, the whole of the prairies may one day become a mining region.

Ferns are remarkably rare on the prairies; indeed I do not recollect having met with a single specimen of any species of that extensive tribe in the more open prairies. This may, perhaps, be owing to the absence of that shade and constant moisture in which most of these plants delight. On the skirts of the timbered tracts, several kinds occur, which are usually found in the barrens, as Pteris aquilina, Polypodium dryopteris, and P. hexagonopterum; and in the 'groves' I observed many other species common in the Western States. The same remarks will apply, in a good degree, to the tribe of mosses.

I deem it improper to close these desultory remarks, without giving a catalogue, at least, of other common plants, which presented themselves at different places on our route through the prairies. Some of them may have been already incidentally mentioned, but the most of them occurred under circumstances not calling for particular note or comment. They are given as I find them in my note-book, without any kind of order or arrangement.--

Verbena stricta,
V. hastata,
Gerardia purpurea,
G. flava,
G. erecta,
G. auriculata,
G. quercifolia,
Petalostemum candidum,
Desmodium, } of various species.
Lespedeza, }
Euphorbia corollata,
Gaura angustifolia,
Typha latifolia,
Cassia chamaecrista,
C. marilandica,
Monarda fiistulosa,
Leptandra Virginica,
Lythrum hyssopifolium,
Pedicularis pallida,
Gillenia stipulacea,
Parnassia palustris,
Gentiana rubricaulis,
G. quinqueflora,
Sium latifolium,
Archemora rigida,
Artemisia caudata,
Polygala verticillata,
P. ambigua,
P. incarnata,
Linum rigidum,
Potentilla fruticosa,
Psoralea floribunda,
Boottia sylvestris,
Plantago cordata,
P. aristata,
Cissus Canadensis,
Chelone glabra,
Angelica triquinata,
Epilobium lincare,
Lysimachia revoluta, &c.

Doubtless many other species came under our observation, but being so common in other parts of the Western country, I omitted to note them.

In relation to the botany of the prairies, I have only to add a few remarks on the shrubs which are found among them; for although in the more open districts of this kind no ligneous or perennial stems are permitted to escape the ravages of the annual fires which sweep over them, yet on the margins of 'sloughs,' and along the courses of the small streams which occasionally meander through them, clumps of bushes and clusters of shrubbery are always to be found. These 'roughs,' as they are called, furnish welcome retreats to grazing cattle, and sometimes to the traveler's horse, from

that annoying pest of these regions--the prairie fly.* In these thickets the more common productions are the hazle, (Corylus Americana,) three species of sumach, (Rhus glabrum, R. copalinum, and R. aromaticum,) several dwarf kinds of plumb, (Prunus,) of which the species were not ascertained, two or three varieties of dogwood, (Cornus sericea, C. asperifolia, C. alba, &c.,) several species of undetermined willows, (Salix.) Besides these, may be mentioned the Amorpha fruticosa, Zanthoxylum fraxineum, (prickly ash,) Prinos verticillata, Ilex prinoides, Aronia melanocarpa, Spiraea tomentosa and S. salicifolia, Symphorea racemosa, Cephalanthus occidentalis, Rubus

* Long foot note omitted.

villosus, (blackberry,) Ribes rotundifolium, called Illinois gooseberry, of which the fruit, though spinous, makes a delicious tart; together with various species of wild roses, grape-vines, &c.

Though not properly falling within the compass of this communication, the object of which has been to give some account of the autumnal botany of the prairies, yet before I close it, I will venture to add a few remarks on the forest trees of Illinois. These, in the main, do not differ from the productions of similar districts in the timbered lands of Indiana, Ohio, Kentucky, and Tennessee. In Illinois, the richest groves, interspersed through the prairies, are constituted mainly of the same kind of trees which indicate the best soils generally in the Western States, as black walnut, hickories, hackberry, (Celtis crassifolia,) sugar-maple, pawpaw, (Porcelia triloba,) &c. The thinner lands are clothed chiefly with oaks of various species, hickories and gums, (Liquidambar

(Footnote continued from Page 195 omitted.)

styraciflua and Nyssa of two or three species,) whilst the poorest soils, those especially of the 'bushy barrens' and 'oak openings,' are occupied mostly with the different kinds of oak, among which the post-oak, (Quercus obtusiloba,) and black-jack, (Q. ferruginea,) are most prominent. I am able, indeed, to indicate but two trees which are in any way peculiar to the forests of Illinois; and these are the paccan and catalpa. Of these the paccan (Carya olivaeformis,) is found abundantly on the southern borders of the State, where about Shawneetown and other points on the Ohio river, it constituted a large portion of the original forest; and from these districts great quantities of the nuts have been exported. They are not considered, however, to be equal, either in size or flavor, to the paccan-nuts of Texas. The other tree--the catalpa, (Catalpa cordifolia,) I have the authority of General Harrison for saying, is found occasionally, and of large size, in the alluvions of the Wabash river, where he considered it to be certainly a native; in opposition to the opinion of the Abbé Correa, who thought it more probable that the seeds may have been derived from trees planted by the early French settlers of Vincennes and other posts. I have seen this tree in similar alluvions among the dense forests of Henderson county, Kentucky.

Whilst walking over the prairies adjoining the town of Bloomington, in company with our friend Dr. John F. Henry, who resides there, he pointed out to us an extraordinary phenomenon in connexion with vegetation, and one only visible, I suppose, in a prairie country. It was a semicircular, or rather horse-shoe-shaped line of herbage, distinguishable very plainly from the surrounding and included growths, by its darker or deeper green hue. He said that these circles or segments of circles, usually of fifteen or twenty feet diameter, were frequently to be seen in summer, and that it was generally believed they were occasioned by lightning. He described the thunder-storms of this region as sublimely majestic and terrific. We had no opportunity of witnessing this display of Heaven's artillery, during our journey; but

in two or three instances afterwards, I think, we observed this singular appearance of the grass on the prairies, indicating what might, perhaps, without impiety, be called 'the foot-prints of the Deity!'

Very respectfully and truly, I am,

My dear Sir, yours,

C. W. SHORT

Professor Drake,
Medical Institute of Louisville,

February, 1845.